

U.S. COAST GUARD

NAVIGATION INFORMATION SERVICE (NIS)

Updated By NIS Staff 03/20/97

The Coast Guard's Navigation Information Service (NIS) is a part of the Navigation Center (NAVCEN), located in Alexandria, Virginia. Formally the GPS Information Center (GPSIC), NIS has been providing information since March, 1990. The NIS is a public information service. At the present time, there is no charge for the information provided. Since its inception, the NIS has experienced rapid growth. This growth has allowed an expansion of normal working hours to improve the timeliness of NIS information. Hours are now continuous: 24 hours a day, 7 days a week, including federal holidays.

THE NIS MISSION

The mission of the Navigation Information Service (NIS) is to:

- *gather, process, and disseminate* timely GPS, DGPS, OMEGA, LORAN-C status, and other navigation related information to users of these navigation services.

Specifically, the functions performed by the NIS include the following:

- Provide the Operational Advisory Broadcast Service (OAB)
- Answer questions by telephone or written correspondence
- Provide information to the public on the NIS services available
- Provide instruction on the access and use of the information services available
- Maintain tutorial, instructional and other relevant handbooks and material for distribution to users
- Maintain records of GPS, DGPS, OMEGA, and LORAN-C broadcast information, and data bases or relevant data for reference purposes
- Maintain bibliography of GPS, DGPS, OMEGA, and LORAN-C publications
- Maintain and augment the computer and communications equipment as required
- Develop new user services as required
- Provide general Radionavigation information

GATHERING GPS INFORMATION

A Memorandum of Agreement (MOA) between the U.S. Space Command (USSPACECOM) and the Coast Guard establishes policies and procedures for the exchange of GPS status information. This agreement addresses relative roles and responsibilities of each organization.

The U.S. Air Force Second Satellite Operations Squadron (2SOPS), which operates the GPS Master Control Station (MCS) in Colorado Springs, provides the following GPS information for the NIS:

GPS Notice Advisory to NAVSTAR Users (NANU) are near real-time operational status capability reports. NANU's are issued to notify users of future, current, or past satellite outages, system adjustments, or any condition which might adversely affect users. NANU's are generated by 2SOPS as events occur.

GPS Status Messages contain general information that is downloaded daily from the 2SOPS's bulletin board. The message contains information about the satellite orbit (plane/slot), clocks, and current or recent NANU's. Status Messages are generated by 2SOPS once a day, Monday through Friday.

GPS Almanacs contain the orbital information and clock data of all the satellites. The almanac for all satellites can be obtained from downloading the continuously transmitted data stream from any satellite.

In addition to receiving information from the MCS, the NIS works with representatives of the National Geodetic Survey (NGS) to offer NGS computed precise GPS orbit data to the public. This data is called precise ephemeris data. NGS provides data products "SP3" (in ASCII format) and "EF18" (in binary format). In the past, NGS distributed this information on diskettes by mail to some users. Precise ephemeris data describes the orbit of each satellite as observed by numerous ground stations. It is useful in making a refined determination of where the satellites were at some time in the past.

For more information about Precise Ephemeris Data contact:

*National Geodetic Information Services Branch
(N/NGS12)
National Ocean Service
National Oceanic and Atmospheric
Administration
Silver Springs, MD 20910
Telephone: (301) 713-3242*

Features of the NIS services are continuously created and improved in response to suggestions from our users. The NIS will continue to work with GPS, DGPS, OMEGA, and LORAN-C organizations to ensure the continuation and development of the best possible user services. Specifically, the NIS will:

- Maintain liaison with other U.S. Government agencies as necessary to sustain Radio-Navigation (RANAV) system status, technical information exchange, and resource availability
- Maintain liaison with the Civil GPS Interface Committee and International Civil GPS organizations to establish the requirements for GPS information exchange

DISSEMINATING GPS INFORMATION

The NIS sends RANAV status information to civil users through Operational Advisory Broadcasts (OAB). These broadcasts contain the following general categories of GPS performance data:

- Current constellation status (GPS)
- Recent (past) outages
- Scheduled (future) outages
- Almanac data (GPS)

The Operational Advisory Broadcast (OAB) consists of textual matter containing the RANAV performance data listed above. Conditions that impair the RANAV for navigational purposes receive special attention and wide distribution. The Operational Advisory Broadcast is updated by the NIS staff at a minimum of once per day. OAB's are updated more frequently if information on changes in the GPS constellation is received.

The following table outlines the update schedule for sources of RANAV information received by the NIS:

SOURCE	UPDATE SCHEDULE
NANU	The NIS staff processes NANU's as soon as possible.
STATUS MESSAGE	The NIS watchstanders post a new message daily (usually around 1 PM, Eastern Standard Time) Monday through Friday, except Federal Holidays.
ALMANAC	The almanac is upload once a week, plus whenever changes that appreciably affect system coverage occur.
NGS	Precise Ephemeris data is usually updated on a daily basis by NGS.

The Operational Advisory Broadcast is disseminated through the following media:

- NIS Internet (www & ftp) services
- NIS Computer Bulletin Board System (BBS)
- NIS 24-Hour Status Recording
- WWV/WWVH worldwide high-frequency radio broadcasts
- Coast Guard Marine Information Broadcasts (MIB)
- DMAHTC Broadcast Warnings
- DMAHTC Weekly Notice to Mariners
- DMA Navigation Information Network (NAVINFONET)
- NAVTEX Data Broadcast
- Fax on Demand (FOD)

Some of these services have limited time or space available for GPS information. The following paragraphs describe each service and the GPS information available.

NIS INTERNET SERVICE (www & ftp)

Any user who has access to the Internet can contact the NIS for information. The NIS operates both WWW and FTP services and can be reached at either www.navcen.uscg.mil or [ftp.navcen.uscg.mil](ftp://ftp.navcen.uscg.mil). Current plans are to upgrade the service to implement a searchable database of archived GPS information, and an E-Mail List Server to allow users to receive and share information via Internet E-mail.

NIS BULLETIN BOARD SYSTEM (BBS)

Any user who has access to a computer and a modem can call the NIS BBS for information. The BBS is free and open to all. However, users will have to pay their own connection charges (long distance telephone or public data network costs). First-time callers are asked to register on-line (provide their names, addresses, etc.) before proceeding to the BBS main menu. Through the BBS, a wide range of information is available 24 hours a day. BBS information is updated whenever the other NIS sources are (see schedule).

To contact the BBS, call

Telephone: 1-703- 313-5910 Modem speeds of 300 to 28,800 bps and most common U.S. or international protocols are supported. Communications parameters should be set to: 8 data bits, No parity, 1 stop bit , asynchronous comms, full duplex. We have three phone lines to accommodate the general public.

GPS information on the NIS Internet and BBS services include:

- NANU's
- Status Messages
- Almanacs
- Precise Ephemeris Data
- Coast Guard DGPS Project Updates
- CGSIC Meeting Announcements, etc.

The Internet and BBS services also contain information about other radionavigation systems:

- Omega Status Messages
- Loran-C User Notification Messages
- Differential GPS Status

In addition, both services have areas set aside for general information about radionavigation and associated topics:

- The text of the Federal Radionavigation Plan
- USAF/NOAA Solar and Geophysical Activity reports
- The Coast Guard's Radionavigation Bulletin
- Local Notice to Mariners
- Marine Communications Notices
- Recreational Boating Safety
- The Coast Guard's National Pollution Funds Center (COFR'S)
- Coast Guard Public Affairs
- Marine Safety, Security and Environmental Protection Information
- Search and Rescue
- Other items which may be of interest to the radionavigation community.

NIS 24-HOUR GPS/OMEGA RECORDING

The 24-hour status recording provides GPS and Omega status information in voice format. The amount of information is strictly limited since the maximum tape length is 92 seconds long.

To reach the status recording, call:

GPS: Telephone (703) 313-5907

Omega: Telephone (703) 313-5906

The following information is available on the 24 hour status recording depending on the space available. The information is prioritized as listed below:

- Cautionary Statement
- Current system status
- Forecast outages
- Historical outages
- Other changes in the GPS

GPS AND OMEGA INFORMATION IS ALSO AVAILABLE FROM THE FOLLOWING SOURCE:

WWV/WWVH: Since 1923, the National Institute of Standards and Technology (NIST), formerly National Bureau of Standards, has provided a highly accurate time service to the national and international time and frequency community. NIST currently broadcasts continuous signals from its high frequency radio stations. Services provided by WWV/WWVH include:

- Time announcements
- Standard time intervals
- Standard frequencies
- Geophysical alerts
- Marine storm warnings
- Omega Navigation System status reports
- Universal Time Coordinated (UTC) time corrections
- BCD time code
- GPS information System status

GPS information is broadcast in voice on WWV/WWVH at the following times and frequencies:

STATION	LOCATION	FREQUENCY	TIME
WWV	FT. COLLINS COLORADO	2.5, 5, 10, 15, 20 MHz	Minutes 14 & 15
WWVH	KAUAI HAWAII	2.5,5, 10, 15 MHz	Minutes 43 & 44

Omega information is broadcast in voice on WWV/WWVH at the following times and frequencies:

STATION	LOCATION	FREQUENCY	TIME
WWV	FT. COLLINS COLORADO	2.5, 5, 10, 15 MHz	Minute 16
WWVH	KAUAI HAWAII	2.5,5, 10, 15, 20 MHz	Minute 47

The time for the WWV/WWVH GPS /Omega broadcasts is strictly limited. Depending on the space available, the GPS information is prioritized as listed below:

- Cautionary Statement
- NIS operating hours and phone number
- Current system status
- Forecast outages
- Other changes in GPS Status

USCG AND National Imaging Mapping Agency (NIMA) MIB USCG Marine Information Broadcasts and DMA Broadcast Warnings are methods by which important maritime navigation information is disseminated in the most expedient manner. This system covers a variety of topics of interest to mariners including:

- Status of navigation aids
- Weather
- Search and Rescue (SAR) operations
- Military exercises
- Marine obstructions
- Ice reports
- Changes in channel conditions
- Important bridge information

Within the United States, the U.S. Coast Guard and the NIMA are responsible for broadcasting the navigation information described above.

The Coast Guard provides vital maritime information in voice format via an established system of VHF and HF radio broadcasts. These Marine Information Broadcasts (MIB) include the following types of messages:

Urgent Messages concerning the safety of a person, ship, aircraft or other vehicle.

Safety Messages containing important navigational or meteorological warnings that cannot be delayed because of hazardous conditions.

Scheduled Broadcasts include:

- Notice to Mariners (NTM)
- Hydrographic information
- Storm warnings
- Advisories
- Other important marine information
- Safety and urgent messages which remain in effect

Cancellation Messages are sent by the originator to cancel previous broadcast when action is no longer necessary.

USCG Marine Information Broadcasts are issued via voice and navtex.

The following table outlines the MIB frequencies:

STATION	COVERAGE
VHF-FM Ch 16 Ch22A	Information that applies to inland waters seaward to 25 nautical miles.
MF 2182 KHz 2670 KHz	Duplicate VHF-FM broadcasts and additionally cover waters out to 200 nautical miles.
NAVTEX 518 KHz	Info that applies to waters from the coastline to 200 nautical miles offshore. (See Below)

Broadcasts are scheduled several times a day depending on the location of the broadcasting site. Stations designated to make regularly scheduled broadcasts are listed in the Coast Guard Radio Frequency Plan. The length of messages broadcast is kept to a minimum.

NIMA is responsible for broadcasting navigation information concerning the "high seas". Information is provided in message format via an established system of message dissemination. NIMA broadcasts are known as **NAVAREA, HYDROLANT, or HYDROPAC** and are generally geared to the deep draft mariner.

NIMA also publishes a weekly Notice to Mariners (NTM) containing USCG Marine Information Broadcasts and NIMA Broadcast Warnings for a seven day period. GPS status information is found in Section III of the Notice to Mariners, which summarizes voice or data broadcast warnings. Additional information on the NIMA Notice to Mariners Information is available from:

*National Imagery and Mapping Agency
4600 Sangamore Road
Bethesda, MD 20816-5003
Telephone: (301) 227-3370*

NIMA NAVINFONET In carrying out its mission to produce Notices to Mariners, NIMA has developed a data base called Automated Notice to Mariners System (ANMS). This data base contains information dealing with navigational safety. It is a supplemental source of up-to-date maritime information for the user. The software developed for this data base provides remote query capabilities which NIMA makes available to the entire maritime community through the Navigation Information Network (NAVINFONET). NAVINFONET provides information in data format via telephone modem. Information includes:

- Chart Corrections
- Broadcast Warnings
- MARAD Advisories
- NIMA List of Lights
- Anti-Shipping Activities Messages
- Oil Drill Rig locations
- Corrections to NIMA Hydrographic Product Catalogs
- Coast Guard Light Lists & GPS

The following GPS information is available from the NIMA NAVINFONET under item 8 in the bulletin board menu:

- Daily Status Rpt
- General Info
- Almanac Data
- Outage Rpt
- Civil GPS Service information

Users must register for the NAVINFONET bulletin board off-line before they will be granted access to the system. For a user ID and information book, contact NIMA at the following address:

*NIMA Navigation Information and Service Dept.
ATTN: NAVINFONET Staff, Stop D-44
4600 Sangamore Road
Bethesda, MD 20816-5003
Telephone: (301) 227-3296*

NAVTEX NAVTEX is an internationally adopted radio telex system used to broadcast marine navigational warnings and other safety related information to ships. This system assures worldwide

coverage by transmitting on an international frequency of 518 KHz. Vessels' NAVTEX receiver/teleprinters are permanently tuned to the worldwide frequency and remain on standby to receive and print out all the messages automatically. Navigation information broadcasted through NAVTEX includes:

- Notices to mariners
- Weather warnings and forecasts
- Ice warnings
- Other marine information

Coast Guard Atlantic and Pacific Area Commanders coordinate NAVTEX broadcasts transmitted by all Coast Guard Communications stations. NAVTEX messages are broadcasted six times a day with a maximum duration of 40 minutes.

NAVTEX messages are categorized by subject area. GPS status messages are in NAVTEX category "J". GPS information available from NAVTEX includes the following:

- Cautionary Statement
- Current system status
- Forecast outages
- Other changes in GPS Status

FOD: The Navigation Information Service provides Navigation Information on a Fax on Demand System (FOD). The FOD is available 24 hours a day at 703-313-5931. Users can download up to five documents at one time.

CONTINGENCY PLAN FOR LOSS OF NIS COMMUNICATIONS

If communications with the NIS are disrupted for an extended period of time (as might happen with a fire or similar casualty), we would announce the problem on the WWV/WWVH radio broadcasts, at the times normally set aside for GPS information. If NIS services were set up at an interim location, the new phone numbers would be announced on WWV/WWVH. Users can hear WWV broadcasts by phone, as well as radio at 14 - 15 minutes past the hour: Telephone: (303) 499-7111

PUBLICATIONS AVAILABLE FROM THE NIS

PUBLICATION	PUBLISHER	DESCRIPTION
NAVSTAR GPS USER EQUIP	JPO	Describes the GPS applications and capabilities.
GPS NAVSTAR OVERVIEW	JPO	Provides general Overview information about GPS
ICD 200	JPO	Technical information about the GPS signal-to-receiver interface.

NAVSTAR GPS SIGNAL SPECS	JPO	Defines GPS services provided by the DOD to the DOT to support user of the system.
DGPS BROADCAST STANDARDS	USCG	Describes the parameters and content of the DGPS signal.
LORAN-C SIGNAL SPECS	USCG	Provides technical description of the Loran-C signal
OMEGA NAVIGATION USERS GUIDE	USCG	Provides a general description of the Omega Navigation system.

NIS WATCHSTANDERS

In addition to updating the OAB, the NIS watchstander responds to individual user inquiries, comments, and concerns about access to, and use of, all Coast Guard operated radionavigation systems. The NIS has watchstanders on duty 24 hours a day, 7 days a week, so this service is available anytime. Most inquiries can be answered immediately over the phone. Some technical questions or requests are referred to a more authoritative source.

NIS QUICK REFERENCE OAB

DISTRIBUTION

The Navigation Information Service provides the Operational Advisory Broadcasts through the following services:

SERVICE	AVAILABILITY	INFO TYPE	CONTACT NUMBER
NIS WATCHSTANDER	24 hours a day	USER INQUIRES	PHONE (703) 313-5900 FAX (703) 313-5920
NIS COMPUTER BULLETIN BOARD SERVICE	24 hours a day	STATUS FORE/HIST/OUTAGES NGS DATA OMEGA/FRPMISC INFO	BBS (703) 313-5910 (300-28800 bps)
Internet	24 hours a day	STATUS FORE/HIST/OUTAGES/ NGS DATA/OMEGA/FRP AND MISC INFO	http://www.navcen.uscg.mil 1 ftp://ftp.navcen.uscg.mil
Fax on Demand	24 hours a day	STATUS FORE/HIST/OUTAGES/ OMEGA AND MISC INFO	(703) 313-5931/5932

NIS VOICE TAPE RECORDING	24 hours a day	STATUS FORECASTS HISTORIC	(703) 313-5906 - OMEGA (703) 313-5907 - GPS
WWV	Minutes 14 & 15	STATUS FORECASTS	2.5, 5, 10, 15, and 20 MHz
WWVH	Minutes 43 & 44	STATUS FORECASTS	2.5, 5, 10, and 15 MHz
USCG MIB	When broadcasted	STATUS FORECASTS	VHF Radio marine band
NIMA BROADCAST WARNINGS	When broadcast received	STATUS FORECASTS	
NIMA WEEKLY NOTICE TO MARINERS	Published & mailed weekly	STATUS FORECAST OUTAGES	(301) 227-3126
NIMA NAVINFONET AUTOMATED NOTICE TO MARINERS SYSTEM	24 Hours a day	STATUS FORECASTS HISTORIC ALMANACS	(301) 227-3351 300 BAUD (301) 227-5925 1200 BAUD (301) 227-4360 2400 BAUD
NAVTEX DATA BROADCAST	All Stations Broadcast 6 times daily at alternating times	STATUS FORECAST OUTAGES	518 KHZ



